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ABSTRACT

The use of computers in teaching basic skills to special education students is examined. Six instructional techniques useful in teaching basic skills are outlined: information delivery, demonstration, drill and practice, problem solving, tutorial, and instructional games. A summary lists the contributions of technologies to effective learning, such as providing feedback to learners, as well as ways to assess the impact of technology on education. A parable on individual differences concludes the paper. (CL)

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SPECIAL STUDENTS, TECHNOLOGY, AND BASIC SKILLS EDUCATION

LOUIS W. FRILLMANN

ABSTRACT

A study of the use of technology in assisting students with special needs to learn basic skills. Issues of concern to teachers, decision-makers and technocrats are addressed including:

1. What are the basic skills needs of special students?
2. How are these needs different than those of students in general?
3. Are these needs changing?
4. How do people learn basic skills?
5. Which instructional technologies can be used to teach basic skills?
6. What technologies are available?
7. What are their capabilities....their limitations?
8. How can we determine their effectiveness, their cost, and the demands they place on decision-makers?

The writer recognizes that a great deal more must be investigated about learning theory, about assessing learning styles, about determining educational objectives and about the handicapping conditions.

The "Not Quite" Child

You've seen him before as he often identifies himself. He lies concealed in the thicket of educational programming, like a newborn fawn . . . . while we wait for him to "grow out of it." Like a broken clock, he chimes only on the half hour, missing the number 12 completely. Playing him as a record, the young years, and on the wrong speed, he hears the discordant quality of his own learning, and the clear, groovy laughter of others. Stare as he may, or gazing pensively, (what is so crystal clear to children younger and smaller), words and their accompanying meaning clump together as an inky cage.

Even his walk appears to be that of a drunken sailor endeavoring to navigate a flagstone path, and finally noticing that every other stone is absent.

He becomes the recipient of drug therapy, the advocate of motor programs, the focus of commercially prepared materials, the proof of educational therapy, and a living, daily reflection of the fact that activity does not mean the same as achievement. The not-quite child suffers from hardening of categories. He may be condemned for his dissimilarities . . . . while his real need is that of understanding, rather than being made to walk/run/march/live to the same cadence as others.

He rides the high tide of frustration, crashing into the sea of classroom discipline like a giant breaker, only to become, moments later, the gentle spray of conformity. His path teeters between the soil of productivity

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and gravitation of academic quick sand.

He is the product of advancement in the space age as well as the neglected artifact of our educational ignorance in the area of human deviation. He is the guilt of professional lip service to the reality of individual differences. He is a rambler over bleak cliffs of parental despair, and the Grand Canyon of potential versus performance. He becomes a man without a country, with physician, educator, and family all drawing maps - often leading him away from things he knows toward even greater complexities. He ricochets among an avalanche of relevant literature, latest funding, and professional concern. He becomes the darling of pressure groups and the adopted child of parent associations. He is the straw that breaks the camel's back, the reason for teacher unions, and the Teen-age drop-out.

You've not seen valleys or mountain peaks until you scan his testing scores. He is the length and breadth of a teacher's TGIF. He defies description, as he is too young, too old, and too tormented. He fragments evaluations, defies diagnosis and confounds all who would lead him. He is on the right side of every educational cliche- "study more", "work harder", and on the wrong side of real meaning.

The child conceived, born and developed out of ambiguity has rendered a new impetus. He is forcing us, because of his "not-quiteness" to review the color, shape, size and intensity of our daily COMMITMENT. If he is to live among us, we cannot allow him to approach adulthood bewildered and lost. If we are to live with ourselves, we shall desire to take him to the park and spend many a sunny afternoon romping, listening, and when necessary, letting him show us his secret places.

Special Students, Technology, and Basic Skills Education

It has long been the dream of parents of special students and educators to match those students with appropriate educational technologies. Recent issues and demands place even greater burdens upon decision-makers as they balance budgets, initiate training programs, deal with technology specialists, and endeavor to produce the classroom environment called for by the I.E.P.!

Technology must be placed into the context of learning theories, styles, and the determination of educational objectives. There is no formula that tells us what technology to use with a specific learner for a given purpose; and if we did have a formula, would we be able to apply it? There are other factors that enter into the decision-making process, each factor is important. Factors include the nonavailability of equipment, the non-readiness of staff or structure, the prioritization of one medium and not another, the presence of technological tools without the educational objectives and many others.

Imperfect as our knowledge about the learning process and the impact of technology, let us acknowledge what we do know:

1. We know that technology is a support system that can be used for teaching and learning, to give us information about "how" and "when" and "where" a student learns best.
2. We know that technology may denote the use of a systematic process of designing and delivering instruction.
3. We know that, under the right circumstances,

technology can do some things as well as good teachers, and some things better.

4. We know that no single strand of technology is more effective than others for all purposes.
5. We know that technology is most effective when educators are most familiar with its capabilities and its limitations.

It is vital that we discuss and demonstrate the impact of technology on learning, student achievement, productivity, school faculty and staff, parents, management, and budgets.

Issues of concern to educators, decision makers and technologists include:

What are the basic skills needs of special students?
How are these needs different than those of students in general?
Are these needs changing?
How do people learn basic skills?
What instructional techniques can be used to teach basic skills?
What technologies are available?
What are their capabilities? their limitations?
How can we determine their effectiveness, their cost, and the demands they place on decision-makers?

The writer recognizes that learning theory must be investigated a great deal more in addition to assessing learning styles, determining educational objectives, and investigating the demands placed upon all of the foregoing by so-called "handicapping conditions," before we can expect to match special kids with appropriate educational technologies.

The Challenge for Administrators in Today's Schools

Articles published since the passage of the Basic Skills Act (Basic Skills and Educational Proficiency Program - Title II of the Educational Amendments of 1978) reiterate the themes that American education is not able to teach cognitive skills or to deliver a well-motivated and hard-working labor force. Where does this leave the education of students with special needs? While we can claim recent breakthroughs in employability and the passing of diploma exams, we must also face the dilemma of structuring and implementing each and every effort dedicated to the improvement of "learning the basic skills" - however they are defined.

Perhaps our task would be a bit less complex if there were any agreement between parents, educators, and the general public about just what "basic skills" are. Are they only the three R's? Must they also include behaviors, job responsibility, human sexuality? Have our expectations regarding basic skills changed with the introduction of communication and information technology? As one job in two is now related to information handling (1-SNYDER), that is, collecting, storing, transcribing, receiving, analyzing, packaging, or distributing information, shouldn't all students (ours included) be prepared to deal with it? Should basic skills now include critical reading, listening, loads of observational experiences, direct contact with decision-making processes or computer literacy? So, improvement is one thing, defining the problem is quite another.

Technology has and will cause changes. Perhaps the one change which strikes most boldly at the "past operational stance of far

too many schools" is the change seen in individualization models for meeting the individual needs, interests, and capabilities of every student. P.L. 94-142 was aimed at just this element. Although not yet fully realized, recognition that students of the same age, in the same grade or class, do not have the same educational needs or learning patterns is changing the way that educators plan and deliver instruction. Side-by side with this change is the parallel development of strategies that actively involve students in the learning and decision-making process. Not an easy time for the "boss", especially when costs are up, enrollment, down, and the budget in a squeeze.

Learning Basic Skills

We are faced, once again, with many more questions than answers, with a critical question up front: WHAT ARE BASIC SKILLS?

Although basic skills are individually determined, most people consider reading, writing and arithmetic central to the curriculum of all schools. Independent living is still dependent upon skills in communication and computation. Few persons, however, would limit the total school offering to the R's and would variously insist on history, geography, citizenship education, science, art, music, and many others; we would quickly add mobility training, independent living skills, auditory training, physical and occupation therapy, behavior modification, job training and work experience, and others to the list.

The year and era of 1984 also raises valid curricular concerns for the '80s and beyond. Will grammar and spelling lose their focus and new importance be placed on the writing process and the structure of written products? (2-RUBIN) Will critical reading, listening and viewing skills become central as society recognizes the need for citizens to distinguish between truth and error, propaganda and fact? Is bilingualism already an outgrowth of communication and travel opportunities?

For those of us who believe that survival is as important as graduation, there is a whole new set of concern. They range from the prevention of institutionalism to "making it" in the work force. What is basic to others will surely not be basic to us. Our goals may be to focus on the blending of what we do best with what others can do to assist our students through vocational training, work opportunities, and habilitation/rehabilitation. Where do you start when you look at the needs of students who require a daily structured approach to learn to deal with themselves, their peers, school, and even basic skills? In such a context, keyboard literacy and early exposure to varied forms of technology will prepare them, hopefully, as consumers, employees, and citizens.

Surely technology can and does deliver instruction, but it is the ability to use the computer tool that is taking on new lustre:

- to solve problems.
- to communicate with others.
- to edit language and use of the functions of word-processing.
- to create graphs and pictorial devices that assist a person to learn and to convey information.

Which Instructional Techniques are Useful in Teaching Basic Skills

(It is difficult to imagine an instructional technique that would not be useful in teaching basic skills.)

..... Information Delivery

student-teacher interchange - directed instruction

lecture - media presentation - observation - direct experience

..... Demonstration

displays of physical/mathematical relationships

doing by an adult requiring a student to imitate

..... Drill and Practice

practice problems or exercises designed to reinforce learning gained from another source

the role of the computer and hand-held devices as scorekeeper, providing motivational feedback and tailoring type of practice depending upon student performance

..... Problem Solving

proposing a solution to a stated/generated problem, stating your own problem offering strategy and potential solutions, and then evaluating and rating

.... Tutorial

small, sequenced bits of a concept are presented

examples given to illustrate the concept

drills the learner - provides feedback on the learner's performance

summarizes the information learned-related it to what's ahead

PLATO - TICCIT - LAPS - even packs for teachers

..... Instructional Games

learning skills/concepts in a competitive cooperative environment

people learn when it's fun or challenging

allows for practicing the application of learned skills

How do People Learn?
or How Do People Learn Best?

No matter what is defined as a basic skill or who defines it, elements that lead to learning success in the basic skill may be common. Ironically, we still have much to learn about how people learn, yet we know from experience and research supports that people learn:

- When their current and changing needs, abilities and interests are accounted for.

pace and individualization

content and learning style

stimulating but not too difficult

flexible instruction and personal attention

- When they are actively involved in learning.

teacher directed instruction vs. student-led discovery

learning/retaining may well depend on learning/using

learning to talk by speaking vs. learning to talk by studying communication

- When they interact with others.

working along vs. learning with others present (3-CHAMBERS)

level of interaction necessary

to produce effective learning (4-JOHNSON)

- When a variety of techniques and materials are used.

variety enhances opportunity

caution raised re: overloading of sensory modalities

- When the design of the instructional materials is interesting and stimulating.

visual appearance - aural/tactile interest

color - animation - sound - graphics

- When they practice and review a skill or concept.

new concepts require reinforcement-old ones, review

- Simulation.

a representation of the key aspects of an environment-real or fictional

learner must make decisions, but does not experience them personally as in real life

generally do not teach basic skills - learner must apply learned skills

question: which comes first?

- Exploration (Inquiry).

student uses content/concept introduced by a teacher or media and then

experimentation, exploration, discussion, problem solving, research, application of what is known, unknown

Summary

Contributions of Technologies to Effective Learning

Meeting the current and changing interests, needs and abilities of individual students

Involving students actively in learning

Promoting interaction with others

Providing a variety of techniques and materials

The design of interesting and stimulating materials

Providing feedback to learners

Providing opportunities to practice a skill until it is mastered

Assessing the Impact of Technology on Education

- What Achievement Gains can Students make with Media?

  test scores
  learning time
  degree of retention
  course completion

- What New Skills and Knowledge will our Students learn with Media?

- What Impact will media have on Attendance, Attrition & Absenteeism?

  adult education
  continuing education
  in-service training
  on-the-job training
  workshops for those who own personal computers (or are about to buy)
  computer time during non-school

hours and weekends

- What Impact will media have on teachers and other school personnel?

knowledge about the medium
skills in using the medium - techniques
skills in using media in the management of instruction
skills in evaluating related materials
skills in designing and developing materials

Individual Differences

Once upon a time animals decided they must do something heroic to meet the problems of a "new world." They adopted an activity (Basic Skills) curriculum consisting of running, climbing, and flying; to make it easier to administer, all the animals took all the subjects.

The duck was excellent in swimming, better in fact than his instructor, made passing grades in flying, but was very poor in running, so he had to stay after school and drop swimming to practice running. The schedule was maintained until his web feet were badly worn and he was only average in swimming. But average was acceptable in school, so nobody worried about that except the duck.

The rabbit started at the top of the class in running, but had a nervous breakdown because of so much "make-up" work in swimming.

The squirrel was excellent in climbing until he developed frustration in the flying class where his teacher made him start from the ground-up instead of flying down from the tree tops. He also developed "charlie horses" from over exertion and then got a "C" in climbing and a "D" in running.

The eagle was a problem child and was disciplined severely. In the climbing class he beat all the others to the top of the tree, but insisted on using his own, best way to get there.

At the end of the year, an abnormal eel that could swim exceedingly well, and also run, climb, and fly a little had the highest average and was class valedictorian.

The prairie dogs stayed out of school and fought the high school tax rates because the administration would not add digging and burrowing to the curriculum. They apprenticed their children to a badger and later joined the groundhogs and gophers to start a successful private school.

ANY LESSONS FOR US??????

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